

B.Tech VIIth Semester (ECE)

Course Code: 18B1WEC733

MAX. MARKS: 25

Course Name: Machine Learning & Data Analytics-I

Course Credits: 03

MAX. TIME: 1.5 Hrs

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Marks are indicated in square brackets against each question

- Q1. a) How deep learning is different from machine learning? [1] [CO1,
b) Why don't gradient descent methods always converge to the same point? [1] CO2]
c) What is meant by 'curse of dimensionality'? How can we solve it? [2]
d) What are parametric models? [1]
- Q2. a) Explain Principal Component Analysis? [2] [CO1,
b) How many principal components should be retained? [1] CO2,
c) How Factor Analysis is different from Principal Component Analysis? [2] CO3]
d) Given the correlation matrix [3]
- $$R = \begin{bmatrix} 1 & 0.9 \\ 0.9 & 1 \end{bmatrix}$$
- i. Compute the Eigen values and the corresponding Eigen vectors.
ii. Compute the loadings of the variables.
iii. What proportion of the total variance in the data does the first principal component account for?
- Q3. a) What is Factor Analysis and why use Factor Analysis? [2] [CO1,
b) What are the usual assumptions for Factor Analysis? [3] CO2,
c) Write the computational steps involved in Factor Analysis. [2] CO3]
d) What is the role of the so-called 'Communalities'? [1]
- Q4. a) Write short notes on Independent Component Analysis. [2] [CO1,
b) What are the similarities and differences between Principal Component Analysis and Independent Component Analysis? [2] CO2, CO3]